

## **REMARKS**

The present Response is intended to be fully responsive to all points of objections and/or rejections raised by the Examiner and is believed to place the application in condition for allowance. Applicants assert that the present invention is new, non-obvious and useful. Prompt reconsideration and allowance of the pending claims are respectfully requested.

## **Status of the Claims**

Claims 10-16 are currently pending.

Claims 1-9 have been cancelled.

## **Summary of Examiner Interview**

Applicants would like to thank Examiner Joel Horning and supervisor Michael Cleveland for granting a telephonic interview on June 6, 2011 with Applicants' representative, Dr. Yuanmin Cai, Reg. # 56,513, to discuss patentability of independent claim 10.

During the interview, the following topics were discussed: 1) whether Uesugi or Jersch teaches that a near-field created by Surface Plasmon resonance at the SFM tip is sufficiently strong to decompose a CVD suitable vapour; 2) whether Uesugi or Jersch teaches that a structure patterned by a tip-intensified near-field has the same characteristic (e.g., finesse, line-width of the structure) as a structure patterned by a far-field of laser light focused by a lens and therefore it is equivalent to use either near-field or far-field in patterning a structure; and 3) whether Uesugi or Jersch teaches specifically that the light beam at the tip is not strong enough to decompose the vapour.

Applicants' representative explained the difference between using a lens to focus a laser light and using an AFM tip to intensify a Surface Plasmon resonance caused by a laser light. Applicants' representative specifically emphasized that the AFM tip does not "focus" the laser light (like a lens does), but rather "transform" the laser light into surface electromagnetic waves that propagate in a direction parallel to the metal (i.e., AFM tip)

and dielectric (i.e., air around the AFM tip) interface. An AFM-tip intensified surface Plasmons are collective electron charge oscillations in the form of metallic nanoparticles that are excited by the laser light and are not a laser light focused by the AFM-tip. More information about surface Plasmon resonance may be found at en.wikipedia.org website, and various text books.

### **Remarks to Claim Rejections**

#### ***Claim Rejections - 35 USC §103***

The April 21, 2011 Office Action continues to reject claims 10-14 and 16 as being unpatentable under 35 U.S.C. §103(a) over Uesugi (US 4873413) in view of Jersch (Applied Physics A 66, pp. 29-34 (1998)).

Applicants respectfully disagree.

It is respectfully submitted that independent claim 10 recites distinctive features and elements that are not taught, suggested, or even implied by references Uesugi and Jersch, alone or in combination. Such distinctive features and elements include, *inter alia*, “exposing the tip … that the tip intensifies an electromagnetic near-field created through a surface Plasmon resonance to such an extent that the vapour is decomposed …”, and “the light beam at the tip … is not enough to decompose the vapour”.

The Office Action alleges that Uesugi teaches a method for direct writing a layer of material onto a substrate by using a lens to focus a laser beam to an intensity to cause thermal decomposition of a precursor. The Office Action then alleges that Jersch teaches a FOLANT technique which creates electromagnetic near field at an SFM tip through surface Plasmon resonance. Based upon the above, the Office Action draws conclusion that it would have been obvious for a person skilled in the art to use FLOANT technique taught by Jersch in Uesugi to arrive at the above distinct features of the present invention.

Applicants respectfully disagree.

Applicants would like to respectfully point out that neither Uesugi nor Jersch teaches, suggests, or even implies using an electromagnetic near-field created through surface Plasmon resonance to decompose a CVD suitable vapour. The electromagnetic

near-field created by the surface Plasmon resonance in Jersch is used to cause surface modification of the substrate. Jersch never teaches that the electromagnetic near-field may be applied to, or is even capable of, decomposing a CVD suitable vapour. Even though Uesugi teaches decomposing a precursor, such decomposition is caused by a focused laser beam and not by an electromagnetic near-field created through surface Plasmon resonance, which is not a focused laser beam (i.e., a laser beam focused by an AFM-tip instead of a lens) and which has a different set of characteristics from a focused laser beam. In view of the above, Applicants respectfully submit that it is not obvious to replace a focused laser beam with an electromagnetic near-field created through surface Plasmon resonance while still expecting decomposition of a precursor to happen.

Furthermore, Applicants would like to point out that neither Uesugi nor Jersch teaches that “an intensity of the light beam at the tip of the Atomic Force Microscope is not enough to decompose the vapour”. To the exact opposite, and admitted by the Office Action, Uesugi explicitly teaches focusing the laser beam to intensify and cause thermal decomposition of the precursor, which is contrary to what are specifically recited in claims 1, 13, and 20.

During the Examiner Interview, it appears that the Examiner is contending that a person skilled in the art would use the SFM-tip of Jersch to “focus” an “un-focused” laser beam of Uesugi to create the surface Plasmon resonance that is necessary to decompose the vapour, and in the meantime the “un-focused” laser beam of Uesugi will not be strong enough to decompose the vapour. Applicants respectfully disagree.

As being discussed above, the SFM-tip of Jersch does not provide any focus to a laser beam incident thereupon, but rather uses focused laser beam in exciting metallic nanoparticles to create collective electron charge oscillations thereby forming surface Plasmon resonance. Specifically, Jersch states that a pre-focused laser beam is used and applied to the substrate/tip region (left col., lines 6-7, page 32) in order to create surface Plasmon resonance. Jersch does not teach, suggest, or imply that creation of the surface Plasmon resonance will be possible with any “un-focused” laser beam.

In view of the above, it is respectfully submitted that the above distinct features of claim 10, among others, are not disclosed by Uesugi and Jersch, alone or in combination. Therefore, claim 10 is patentable.

Claims 11-16 depend from independent claim 10 and include all the distinctive features of claim 10, in addition to other distinguishing features and elements. Claims 11-16 are patentable at least for the same reasons as discussed above with regard to claim 10.

In view of above remarks, Applicants respectfully request that rejections of claims 10-16 made under 35 U.S.C. §103(a) be withdrawn.

**Conclusion**

In view of the preceding remarks, Applicants respectfully submit that all pending claims are now in condition for allowance. Favorable reconsideration and allowance of the claims are respectfully requested.

Applicants are paying a fee for the filing of a Request for Continued Examination and a fee for the filing of request for a one-month time extension. No other fees are believed to be due in connection with this paper. However, if there are any such fees due, please charge any such fees to the deposit account No. 09-0458.

Respectfully submitted,

/Yuanmin Cai/

---

Yuanmin Cai, Ph.D.  
Agent for Applicants  
Registration No. 56,513

Dated: June 14, 2011

**INTERNATIONAL BUSINESS MACHINE CORPORATION**  
Intellectual Property Law Department, East Fishkill  
2070 Route 52, Bldg-321, Zip-482  
Hopewell Junction, NY 12533  
Tel: (845) 894-8469  
Fax: (845) 892-6363